

REMARKS

This is intended as a full and complete response to the Final Office Action dated July 2, 2004, having a shortened statutory period for response set to expire on October 2, 2004. Please reconsider the claims pending in the application for reasons discussed below.

Claims 8, 10, 11, 14-19, 21, 25-30, 35, and 36 remain pending in the application and are shown above. Claims 8, 10, 11, 14-19, 21, 25-30, 35, and 36 stand rejected by the Examiner. Reconsideration of the rejected claims is requested for reasons presented below.

Applicants note that the Examiner has indicated that Applicants' amendments in the Response to Final Office Action dated March 24, 2004, necessitated a new ground of rejection that relies on *Kido, et al.*, and has made the Office Action dated July 2, 2004 final. Applicants submit that *Kido, et al.*, as used by the Examiner in the rejections discussed below, would have been applicable to Applicants' claims prior to entry of the amendments in the Response to Final Office Action dated March 24, 2004. Thus, Applicants submit that the amendment of the claims did not necessitate the new grounds of rejection. Applicants respectfully request withdrawal of the finality of the rejection.

Applicants propose amending claims 17 and 36 to correct matters of form. These amendments are not presented to distinguish a reference, thus, the claims as amended are entitled to a full range of equivalents if not previously amended to distinguish a reference. Applicants submit that the changes made herein do not introduce new matter.

Claims 8, 10, 11, 14-19, 21, 25-30, 35, and 36 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Homma, et al.* in view of *Kido, et al.* (U.S. Patent No. 6,299,659) on grounds that it would have been obvious to substitute a conventional, inexpensive metal oxide abrasive such as silicon dioxide for the ceria abrasive in the method of *Homma, et al.*, in view of *Kido, et al.* Applicants respectfully traverse the rejection.

Homma, et al. describes polishing an organic insulating film of a silicon compound with a slurry containing cerium oxide and teaches that the removal rate of the organic insulating film with the slurry containing cerium oxide was about five times as high as the removal rate of the organic insulating film with a slurry containing silica. Applicants note that *Homma, et al.* does not teach or suggest the composition of a silica-containing slurry for polishing an organic insulating film and instead teaches away from the use of silica for this purpose, finding that the removal rate using silica was one fifth that of the removal rate using cerium oxide (column 7, lines 16-20).

The Examiner indicates that *Homma, et al.* teaches the use of an aqueous solution of abrasive within the pH range cited. Applicants note that *Homma, et al.* describes a solution of ceria having a pH of over 7.5 for polishing an organic insulating film (column 4, lines 29-35) and a solution of silica particles having a pH of over 7.5 for polishing a SiO₂ film (column 1, lines 21-33). However, *Homma, et al.* does not teach or suggest polishing an organosilicate layer using a slurry including silica, wherein the slurry has a pH of about 10 or greater.

The Examiner further states that it is known from *Kido, et al.* to use silicon dioxide in lieu of ceria as the abrasive in polishing wafers. *Kido, et al.* provides ceria slurries for polishing silicon dioxide and silicon nitride films of LSI devices. *Kido, et al.* does not discuss polishing organosilicate layers. Applicants submit that *Kido, et al.* does not teach or suggest using the ceria or silica slurries described therein to polish an organosilicate layer. Moreover, the examples of *Kido, et al.* also illustrate that silica slurries and ceria slurries produced different polishing results for the same films, i.e., silicon dioxide and silicon nitride films. Thus, *Kido, et al.* does not teach or suggest that ceria slurries and silica slurries are functionally equivalent. In fact, *Kido, et al.* states that for the invention described therein, the abrasive grains have been limited to ceria, as satisfactory polishing results were not obtained with silica or manganese dioxide abrasive grains (column 2, line 64 - column 3, line 5).

Applicants further submit that *Homma, et al.* in view of *Kido, et al.* does not teach or suggest polishing an organosilicate layer with a silica slurry having a pH of about 10 or greater. Applicants submit that there is no motivation to use the silica slurries that *Kido, et al.* describes in comparative examples for polishing silicon dioxide and silicon

nitride films in the process of *Homma, et al.*, as *Homma, et al.* teaches that polishing an organic insulating film with a ceria slurry resulted in a higher removal rate than polishing an organic insulating film with a silica slurry.

Thus, *Homma, et al.* in view of *Kido, et al.* does not teach, show, or suggest a method for planarizing an organosilicate layer, comprising positioning a substrate having an organosilicate layer thereon in a polishing system, providing a slurry including silica as an abrasive material dispersed in a solvent to the polishing system, wherein the slurry has a pH of about 10 or greater, and polishing the organosilicate layer using the slurry, as recited in claim 8. Applicants respectfully request withdrawal of the rejection of claim 8 and of claims 10, 11, and 15-18, which depend thereon.

Regarding claim 19, Applicants submit that *Homma, et al.* does not teach or suggest polishing an organosilicate layer with a slurry including potassium hydroxide. *Homma, et al.* teaches polishing an organic insulating film with a slurry containing ceria and a pH adjusting agent such as ammonia, waterholding hydrazine or an amine containing neither sodium nor potassium, or an acid. As *Homma, et al.* describes polishing an organic insulating film with a slurry containing a compound that does not include potassium, Applicants submit that *Homma, et al.* does not motivate or suggest polishing an organosilicate layer with a slurry including KOH.

Applicants further submit that *Homma, et al.* in view of *Kido, et al.* does not teach or suggest polishing an organosilicate layer with a slurry including KOH. *Kido, et al.* describes polishing silicon dioxide and silicon nitride with a silica slurry that contains KOH. However, *Kido, et al.* does not teach or suggest polishing an organosilicate layer with a silica slurry that contains KOH. Moreover, as discussed above with respect to claim 1, there is no motivation to replace *Homma, et al.*'s ceria slurries with *Kido, et al.*'s silica slurries in *Homma, et al.*'s process for polishing an organic insulating film.

Thus, *Homma, et al.* in view of *Kido, et al.* does not teach, show, or suggest a method for fabricating a device, comprising providing a substrate having conductive features formed thereon with an organosilicate layer deposited between and on top of the conductive features, positioning the substrate in a polishing system, providing a slurry including silica as an abrasive material dispersed in a solvent and potassium hydroxide (KOH) to the polishing system, wherein the slurry has a pH of about 10 or

greater, and polishing the organosilicate layer using the slurry, as recited in claim 19. Applicants respectfully request withdrawal of the rejection of claim 19 and of claims 21 and 25-29, which depend thereon.

Regarding claim 30, Applicants submit that *Homma, et al.* does not teach or suggest polishing an organosilicate layer with a slurry including potassium hydroxide (KOH) or ammonium hydroxide (NH₄OH), a pH of about 10 or greater, and a concentration of silica within a range of about 22% by weight to about 30% by weight. As discussed above, *Kido, et al.* does not teach or suggest using the silica slurries provided therein to polish organosilicate layers. Furthermore, there is no motivation or suggestion in *Homma, et al.* or *Kido, et al.* to use the silica slurries described in *Kido, et al.* for polishing silicon dioxide and silicon nitride in *Homma, et al.*'s process of polishing an organic insulating film.

Therefore, *Homma, et al.* in view of *Kido, et al.* does not teach, show, or suggest a method for planarizing an organosilicate layer, comprising positioning a substrate having an organosilicate layer thereon in a polishing system, providing a slurry including silica as an abrasive material having an average particle size greater than about 35 nm and dispersed in a solvent and potassium hydroxide (KOH) or ammonium hydroxide (NH₄OH) to the polishing system, wherein the slurry has a pH of about 10 or greater and the concentration of the abrasive material in the slurry is within a range of about 22% by weight to about 30% by weight, and polishing the organosilicate layer using the slurry, as recited in amended claim 30. Applicants respectfully request withdrawal of the rejection of claim 30 and of claims 35-36, which depend thereon.

In conclusion, the references cited by the Examiner, alone or in combination, do not teach, show, or suggest the invention as claimed.

Having addressed all issues set out in the Final Office Action, Applicants respectfully submit that the claims are in condition for allowance and respectfully request that the claims be allowed.

Respectfully submitted,



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